

# What will neuroscience do for advertisers?

**Tim Ambler**, London Business School, argues that while neuroscience has great potential, this lies in the future. Meanwhile, caution is advised

**N**EUROSCIENCE WILL NOT make the advertiser's job any easier. It will sweep in and out of fashion, but understanding how ads change minds, and how minds change behaviour, are topics too big to go away in the manner of fads like media-neutral planning. This article aims to guide the advertiser between the rocks of unreasonable expectations and the hard places of cynical dismissal. Neuroscience will do a great deal for advertisers and some things are valuable now.

The first section deals with myths and nonsense. The second section looks briefly at the influence of science on advertising. The advent of account planning in the 1960s knocked aside the idea that advertising is purely creative, a craft if not an art. The third section addresses some of the useful things that neuroscience tells us now. Finally, I speculate about what it may tell us in the future. It took more than 60 years for primary X-ray research to become a practical tool in ever' dentist's surgery. Much the same timeframe can be expected for neuroscience. It has little practical value today, but we need to understand the possibilities and capabilities in order to realise its huge potential in the future.

## Myths and nonsense

Before going on to what neuroscience can do for advertisers, it may help to clear some brushwood. Despite claims from the likes of Neuroco, Neurosense and Brainwave Science, brain scanning cannot accurately predict the success of particular ads or campaigns. Yes, some do benchmark well enough against traditional copy (or pre-) testing methods, but although those methods work well for some brands sometimes, in general both are poor predictors for a number of reasons (i). Neuroscience can detect the strength and the locations of responses to stimuli, such as advertising. So can copy testing. The presumption is that the more positive areas 'light up', the better the ad. But standout and immediate ad factors (liking aside) are poor predictors of campaign success because they reveal the 'now' and not the 'future'.

Much the same applies to packaging research. Neuroscience can detect brand

familiarity (part of brand equity) and the strength of reactions to the unfamiliar. It probably can rank degrees of liking for a package at first perception. It cannot predict future purchase levels.

The first reason for this 'now yes, future ho' point is that one scan only scans present stimuli processing or functioning and past memories. To the extent habits or predispositions predict future behaviour, then one could argue some case for prediction, but not in this context because we are looking for behavioural changes.

Direct response aside, advertising does not sell anything; it simply enhances brand memory or brand equity. It creates demand for future sales, or the propensity to purchase, but it does not trigger a sale. The reason is simple: short-term memory lasts only a few hours. If we are shopping the day or a week or a month after the advertising, short-term memory will long have been wiped out. So the question is whether anything transferred to long-term memory. Changes to long-term memory, fusing neurons, are persistent, if not permanent (2).

Advertising therefore, direct response aside once again, has to be seen as a two-stage process: building brand equity and then brand equity producing the desired effects such as sales or, more importantly the willingness to pay a premium price. Economists have a real problem understanding why the largest seller in a category, i.e. the brand leader, is typically priced higher than most other volume brands. The answer is simple: brand equity is largely driven by advertising and brand leaders typically advertise more than other brands,

The second reason why neuroscience cannot predict, therefore, is that we do not know how these responses to stimuli (which we can measure) are laid down for later and how they are drawn on at the time of purchase choice. Maybe we will know these things some day, but not in the foreseeable future.

It is tempting to see neuromarketing as having more quacks than a poultry farm, but that would not be fair. Most of today's neuromarketing suppliers have some solid achievements that provide reassurance. Advertisers need to look carefully at the fine print in judging wider claims.

Brainwave Science (3), as a random example, is probably one of the better ones and / would not quarrel with its use of electroencephalograms (EEGs) for identifying individuals (like finger printing) used by the police, or ad stimuli as discussed above. Advertiser questions they raise go much wider. Here are some of them:

- > What specific information do people retain from advertising?
- ^ Which type of media is most effective?
- > What commercial is the most effective for a single product?
- ^ How effective is the product branding strategy?
- ^ How effective is an ad campaign in different parts of the world?
- > What is the correlation between the campaign and the point of sale?
- > How do the effects of campaigns vary with the influence of time?

Look more closely, though, and they say these are only 'possibilities'!

The other reasons for scepticism about future predictions are the number of unknowns, such as competitor and retailer behaviour. These perhaps are common to all alternatives being compared. The question is not so much what the profit return will be so much as which campaign - for example, the current or the new one - should get the budget. But, even here, the reactions to immediate stimuli gathered by neuroscience can be grossly misleading. In short, do not buy neuromarketing today until you have checked the fine print.

## What has science done for advertising?

There are earlier claims, such as those of Claude Hopkins (4) in the 1920s, but the development of account planning in the 1960s was perhaps the dawn of practitioner-led, scientific methods in advertising (5). This marshalling of evidence is, along with econometric methods, as close to science as advertising gets. The parents of marketing theory, psychology and economics, have achieved remarkably little for advertising, and that may have resulted from their addiction to rational methods and explanations. Some economists, for example, persist in seeing advertising as purely a means of transferring information. In this

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model, the brain, is a computer-like device for processing information using some logical algorithms. Biologists know that the brain is nothing like that. Conjoint analysis, for example, tried to model human decision-making by trading off different preferences or judgements. It has been popular with academics since the early 1970s (6) but, despite being termed state-of-the-art for most of the 35 years since, some would say it has made little impact with practitioners.

Difficult as it is to use, the key problem is that it does not simulate human brain processes. Yes, it can get the right answer, but not in the right way.

A contributor to the problem is that advertising has long been seen, as Claude Hopkins recognised, to be a form of salesmanship. The aim was to marshal logical reasons why the customer should buy; ideally, unique selling propositions (USPs, Rosser Reeves). The Attention Interest Desire Action (AIDA) model, originally a sales mnemonic back in 1898, was adopted by advertisers and is still around despite all the evidence against it.

Psychologists now recognise that ad processing is only partly rational, and sometimes not rational at all - making things tough for rational scientists. Their whole paradigm is logic and you may as well ask a priest to conduct a black mass. Psychologists have a different problem, namely that their discipline is not well grounded in brain science. For two centuries they have been 'talking about the human soul' (whatever the word means) without ever seeing one. Psychology has made valuable contributions by relating behaviour to stimuli without understanding what is happening in between, specifically in the head.

The methods of psychology and studying the stimuli/behaviour effects of advertising are much the same and have yielded key results such as the importance of ad likeability for advertising effectiveness. Psychologists have also taught us much about the importance of 'framing', specifically how responses to stimuli differ according to the context in which they are presented.

Psychologists have themselves recognised the gap and created 'cognitive psychology' in the 1970s to focus on what is going on in the mind itself. The evolution of the word 'cognitive' tells its own story. Originally it meant knowing (cogitation is thinking); it became thinking or rationality, and cognitive psychologists had computers as a model for how the brain worked. Being scientists, the a-rational was unpopular and consigned to the too difficult box. As it became clear that the computer is a dreadful model of the human brain, and that feelings and emotions were important and pervasive, 'cognitive' has expanded for some, but not all, as almost anything in the brain or perhaps any conscious brain activity. Today, those dealing with cognitive psychologists are advised to start by asking what they mean by cognitive before proceeding to advertising applications. At least psychology is now moving towards neuroscience and that will bear fruit in due course.

One very interesting study researching framing effects found that they are linked with amygdala activity, suggesting a key role for feelings in decision making (7). That is consistent with other decision-making neuroscience but the interesting point arising from this research is that the framing adds to the sophistication of the decision and may have evolutionary advantages even if it makes choice less rational. From an advertiser's point of view, it makes context all the more important.

One cannot leave the question of the contribution of science, if that includes mathematics, to advertising without paying our respects to econometrics. Originally, the technique was focused on trying to optimise the advertising budget, but its use is now far more important as it assesses the relative importance of all aspects of the marketing mix and external factors to profitability. It is just as valuable for planning as post-campaign evaluation. Binet and Field have shown that, for all case histories in the IPA's dataBANK, econometrics was used in 15% with other evaluation methods at 85%. For the cases that showed substantial business effects, i.e. the most successful ones, econometrics usage was 81% versus 47% for other methods (8).

## Lessons from neuroscience

Some neuroscience research has been done on how advertising inputs are received by the brain and how purchasing decisions are made (9). This goes some way to confirm the importance of emotion, or feelings, over rationality. More importantly, some part of brand equity has been located in the upper, right side of the brain. Generalisation is complicated by different brains being ordered in different ways for different people. That is why some people are left-handed and are typically excluded from neuroscience studies of this type. Furthermore there is a wide range of advertising, from classified to big-screen cinema commercials. They have different objectives and work in different ways. The information model of economists works quite well for classified advertising.

Decisions for things like brand choices in a supermarket take around one second to make in two equal stages: ordering the problem and making the choice. Men and women seem to use different pathways for the first half-second but the same ones for the second. On the other hand, when one familiar brand is in the choice set, the process is the same for the first half-second but different, and quicker, for the second (10). We found four distinct stages in fact, as shown in Figure i. The first two are, loosely, ordering the problem and the second two making the choice.

The big gap in the work to date is connecting the short-term memory presumably affected by the advertising to long-term memory and that in turn to decision-making. That is a dynamic process and we have little idea how it works. These are early days. Some research will confirm what has been found and other work will doubtless contradict it.

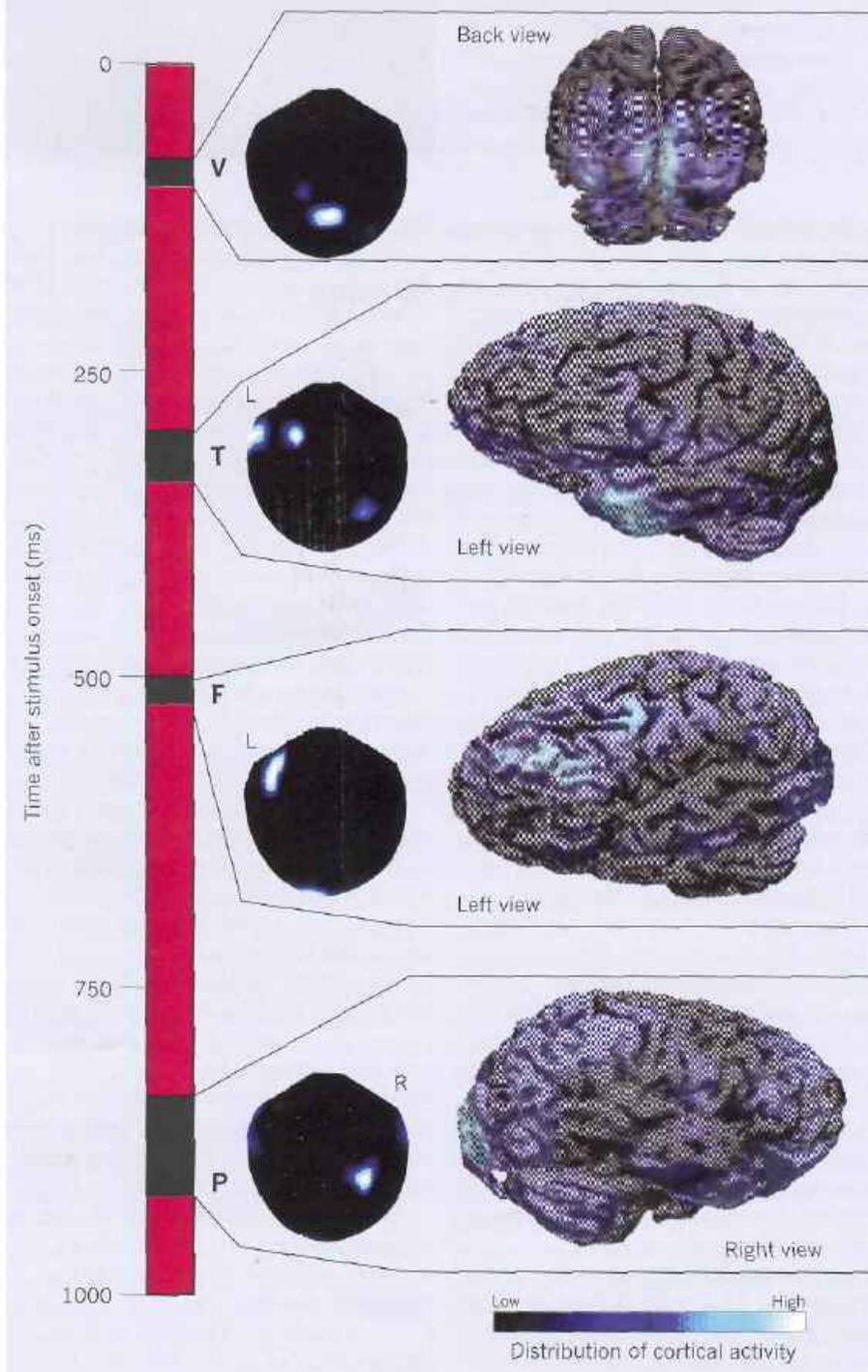
## Expectations

In addition to plugging the gaps mentioned above, we can look to neuroscience to tell us more about our susceptibility to advertising and which forms of advertising work best for which kinds of people in which contexts.

For example, there are major neuroscience research projects now under way into autism, Autism is a broad category >

FIGURE 1

## The four distinct brain activation stages detected in simulated supermarket shopping



with about three dimensions that inter-correlate to some degree: social development, communication (both ways) and repetitive behaviour (habits). We are all autistic to some extent, but some of us are more autistic than others along each of these dimensions. It seems, to me at least, probable that we are likely to be more susceptible to mass media advertising the less autistic we are. It is possible that these scales of autism will provide indices of advertising suggestability.

Possibly related to the autism issue is why ad likeability and humour predict ad effectiveness. We need to turn our attention from sales, or market share, to price, which is a more important generator of profits. We tend to be prepared to pay more to visit a restaurant we like even though the food and service may be comparable elsewhere.

A more definite expectation is that brain scanning, like X-rays in their time, will become far easier to use and therefore economic for advertisers.

A third expectation is that we will one day be able to study responses to stimuli in real time, which will mean that we can change the contexts for those stimuli and see how, for example, framing works.

Fourth, we should discover other parts on brand equity - specifically, brand memories - in the brain and learn more about how to measure them, both absolutely and in relation to other members of the discrimination set. Ultimately we should be able to measure the size of the reservoir of future cash flows without depending purely on forecasting future cash flows. In effect, this means that we need to, and will, know more about competitive effects.

### Conclusion

We are only at the beginning of the application of neuroscience to advertising. On the one hand, we should be cautious about big claims but, on the other hand, we should be open-minded and even excited about the potential it brings.

- i. L Binet and PField: *Marketing in the Era of Accountability*. IPA and WARC, 2007. T Ambler and S Goldstein: *Pre-testing: Practice and Best Practice*. Advertising Association, Henley-on-Thames, WARC, 2003.
2. ER Kandel, JH Schwartz and TM Jessell: *Principles of Neural Science*. 3rd edition, Appleton & Langs, Norwalk, Connecticut, 1991. See Chapters 64 and 65.
3. [www.brainwavesdence.com/research.php](http://www.brainwavesdence.com/research.php)
4. CC Hopkins: *Scientific Advertising*. MacGibbon S-Kee: London, 1968. First published 1923.
5. See P Feldwick *Account planning: 'its history and its significance for ad agencies'*, in *Handbook of Advertising*, eds. G / Tellis and T Ambler, London: Sage Publications, 2007, pages 184-198.
6. See for example 'Conjoint analysis in consumer research: issues and outlook', P E Green, V Srinivasan: *Journal of Consumer Research*. Gainesville: Sept. 5 (2), 1978; page 103.
7. B De Martina, D Kumaran, B Seymour, R J Dolan: 'Frames, biases, and rational decision-making in the human brain', *Science*, 313 (5787), 2006, pages 684-687.
8. *Op. cit.*
9. See H Plassmann, T Ambler, S Braeutigam and P Kenning: 'What advertisers can learn from neuroscience', *International journal of Advertising*, 26 (2), 2007, pages 151-176.
10. S Braeutigam, S Rose, S / Swithenby and T Ambler: 'The distributed neuronal systems supporting choice making in real-life situations: differences between men and women when choosing groceries detected using magnetoencephalography', *European Journal of Neuroscience*, 20, 2004, pages 293-302.